

### **REMARKS**

Applicant notes that the Office Action Summary shows that claims 1-4, 6-16, 19-29 and 39-43 are in the application. It is applicant's understanding that claims 1-4, 6-16, 19-29 and 39-44 are in the application. Applicant respectfully requests clarification.

This Amendment cancels claims 23, 25, 26 and 28 without prejudice to reduce the issues, and amends claims 13, 21 and 29 to more positively recite applicant's patentably novel sheet bending apparatus. Claims 13, 19-22 and 44 have allowable subject matter.

Claims 13, 19-22 and 29 are objected to because of the alleged informalities in claims 13, 21 and 29 listed on page 2 of the Office Action. Applicant respectfully traverses the objection to claims 13, 19-22 and 29 for the listed informalities; however, to eliminate this issue, claims 13, 21 and 29 are amended to, among other things, correct the alleged informalities. Based on the forgoing, applicant respectfully requests withdrawal of the objection to claims 13, 19-22 and 29 for informalities.

Claim 13 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims. Applicant respectfully traverses the objection to claim 13, however to eliminate this issue claim 13 presently dependent on claim 1 is amended to include all of the limitations of claim 1. Support for the amendment to claim 13 is found, among other places, in the pending claims. Based on the forgoing, applicant respectfully requests admission of the amendment to, consideration of, withdrawal of the objection to, and allowance of, claim 13.

The Office Action states that claims 19, 20, 21, 22 and 44 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph set forth in the Office Action. Applicant notes that claims 19, 20, 21, 22 and 44 were not rejected under 35 U.S.C. 112, second paragraph; claims 19, 20, 21 and 22 were objected to for informalities (see Page 2 of the Office Action). Claims 19, 20, 22 and 44 are dependent on claim 21. As

discussed above, applicant has amended claims 21 and 29 to overcome the informalities. Based on the forgoing, applicant respectfully requests allowance of claims 19, 20, 21, 22 and 44.

Claim 43 is rejected under 35 U.S.C. 112, first paragraph as failing to comply with the written description requirement. Applicant respectfully traverses the rejection of claim 43 under 35 U.S.C. 112, first paragraph and requests reconsideration thereof.

Claim 43 is dependent on claim 1 and recites, among other things, that the surface of the shaped press face is a non-porous surface. The specification on page 12, lines 15-19 states that

The downwardly facing press face 49 of the upper shaping member 28 of the upper mold 20 is generally convex downward in elevation, i.e. convex surface of a solid as shown in FIG. 2 and the shape of the press face defines the desired glass surface contour about the periphery of the glass sheets 24 and 25 as well as the desired contours of the central region of the glass sheets. (underline added)

Applicant respectfully submits that one skilled in the art reading the text on page 12, lines 15-19 of the application is taught that the press face is a convex surface of solid, and is therefore taught that the shaped press face is a non-porous surface (also see press face 49 in Fig. 2).

Based on the forgoing, applicant respectfully requests withdrawal of the rejection of claim 43 under 35 U.S.C. 112, first paragraph and requests allowance or allowability of claim 43.

Claims 6, 9-12, 29, 39 and 40 are rejected under 35 U.S.C. 112, second paragraph. The Office Action alleges that claim 29 recites the limitation "the sheet pressing position" in line 30 and there is insufficient antecedent basis for this limitation in the claim. Claims 39 and 40 are dependent on claim 29. Applicant respectfully traverses the rejection of claims 29, 39 and 40 under 35 U.S.C. 112, second paragraph and requests reconsideration thereof. Line 16 of amended claim 29 presented in the previous amendment (line 15 of claim 29

presented above) recites "a sheet pressing position." Based on the foregoing, applicant respectfully submits that there is sufficient antecedent bases for the limitation "the sheet pressing position."

Regarding claims 6 and 9-12, applicant notes that claims 9-12 are dependent on claim 8, and that claim 8 is dependent on claim 6. Applicant is proceeding with the understanding that claim 8 is included in this rejection, and applicant requests to be advised if his understanding is incorrect. The Office Action alleges that the term "securely" in claims 6 and 8-12 is a relative term that renders the claim indefinite. As an example, the Office Action alleges that it is not evident precisely what the nature of the contact must be in order to rise to the level of being "securely" attached. Claims 8-12 are dependent on claim 6.

Applicant respectfully traverses the rejection of claims 6 and 8-12 under 35 U.S.C. 112, second paragraph and requests reconsideration thereof. Claim 6 recites that "the outer wall is securely attached to the second mold." The term "attach" is defined in the *Webster's Third New International Dictionary*, copyrighted 1961 as "connect" and "make fast or join"; the term "securely" is defined as "firmly" and the term "fast" is defined as "firmly, fixedly, securely." As can now be appreciated, using the term "attached" in claim 6 could mean that the "outer wall is made fast to the second mold", or could mean that the "outer wall is joined to the second mold." The term "securely attached" positively recites that the "outer wall is made fast to the second mold."

Based on the foregoing, applicant respectfully requests withdrawal of the rejection of claims 6, 8-12, 29, 39 and 40 under 35 U.S.C. 112, second paragraph.

Claims 1, 2, 4, 6, 7, 12, 14, 41 and 42 are rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C 103(a) as obvious over Montonen, U.S. Patent No. 5,383,947 (hereinafter also referred to as "Montonen"). Applicant respectfully traverses the rejection of claims 1, 2, 4, 6, 7, 12, 14, 41 and 42 under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C 103(a) as being obvious over Montonen.

Claim 1 on which claims 2, 4, 6, 7, 12, 14 and 42 are dependent recites a sheet bending apparatus, having, among other things:

a first shaping mold and an outline shaping mold defined as a second shaping mold, wherein

the second mold has a pair of spaced end rails and a pair of spaced central rails, the pair of spaced end rails and the pair of spaced central rails defining a boundary around an open area and portions of the end rails and the central rails providing a sheet supporting surface, and

the first mold having a major surface in facing relationship to the sheet supporting surface and the open area of the second mold and at least one passageway having a first end and an opposite second end; the major surface comprising a perimeter and a shaped press face surrounded by a boundary, the boundary of the shaped press face within, and spaced from, the perimeter of the major surface; the major surface having a marginal edge between the perimeter of the major surface and the boundary of the shaped press face, and the marginal edge surrounding the shaped press face, wherein the shaped press face is a convex surface of a solid and the first end of the at least one passageway is at the marginal edge of the major surface of the first mold;

an outer wall having an inner surface, wherein the inner surface of the outer wall defines a boundary;

an elevator arrangement acting on at least one of the first and second molds to move the first and second molds and the outer wall relative to one another between a first position, wherein the first and second molds are spaced from one another and the outer wall is spaced from and out of contact with at least one of the first and second molds, and a second position, wherein the outer wall is in contact with the first and second molds to form an enclosure wherein the first shaping mold provides one side of the enclosure, the second mold provides an opposite

side of the enclosure and the sheet supporting surface of the second mold and the first end of the passageway of the first mold are within the boundary defined by the outer wall, wherein the sheet supporting surface of the second mold is in facing relationship to the major surface of the first mold, and fluid communication between interior and exterior of the enclosure is provided through the open area, and the at least one passageway, and wherein with a sheet to be shaped in the enclosure, peripheral edge of the sheet to be shaped is spaced from the inner surface of the outer wall.

Montonen discloses an apparatus for bending glass sheets that includes a porous mould 2 above a glass sheet 1; the glass sheet is supported on a ring mould 13. Montonen discloses in column 1, lines 52-54 that the edges of the mould 2 are surrounded by a ring-like wall 4, defining an annular suction port 5 between the wall 4, and the edge of mould 2. Applicant's claim 1 recites that the major surface of the first mold comprises a perimeter and a shaped press face surrounded by a boundary, the boundary of the shaped press face within, and spaced from, the perimeter of the major surface of the first mold.

Applicant respectfully submits that Montonen shows in Figs. 1 and 2 that the perimeter of the mould 2 and the boundary of the mould 2 are the same because the perimeter and the boundary of the shaped press face of the mould 2 coincident with one another and are equally spaced from the periphery of the glass sheet 1. Further the shaped press face of the mould 2 of Montonen is surrounded by the ring-like wall 4, and the wall is spaced from the periphery of the mould 2 to provide an annular suction port 5. In other words, there is a void or opening surrounding the perimeter and the boundary of the press face of the mould 2 of Montonen.

The figure on page 5 of the Office Action shows the distance between the peripheral edge of the glass 1 and the peripheral edge of the mould 2 as the "marginal edge of the first major surface of the first mold" as recited in applicant's claim 1. It is noted that the "marginal edge" recited in applicant's claim 1 is

between the perimeter of the major surface of the first mold and the boundary of the shaped press face, whereas in Montonen there is no marginal edge between the distance the perimeter of the major surface of the first mold and the boundary of the shaped press face. Instead of a marginal edge, Montonen has an annular suction port.

Claim 1 further recites an outer wall having an inner surface, wherein the inner surface of the outer wall defines a boundary, and that the outer wall is in contact with the first and second molds to form an enclosure. In the figure on page 5 of the Office Action, the wall 4 of Montonen is designated as the outer wall recited in claim 1. Applicant respectfully submits that the inner surface of the wall 4 does not contact the first and second molds as recited in claim 1. More particularly, the suction port 5 separates the inner surface of the wall 4 from the mould 2 of Montonen. The inner surface of wall 4 of Montonen is shown in the figure on page 5 of the Office Action as contacting the glass sheet 1. Applicant acknowledges that if the glass sheet were removed, the argument could be made that the inner surface of the wall 4 contacts the ring mould 13. Applicant respectfully submits, however, that it is unlikely that the wall would be allowed to contact the ring mould 13 because such contact would damage the inner surface of the wall 4, and the damaged surface of the wall could damage the edge or major surface of the glass sheet during the pressing operation.

Claim 4 dependent on claim 1 recites, among other things, that the outer wall is securely attached to the first mold and intersection of the inner surface of the outer wall and the major surface of the first mold defines the perimeter of the major surface of the first mold. Applicant respectfully submits that Montonen discloses that the inner surface of the outer wall is spaced from the mould 2 by the annular ring 5, and therefore, Montonen does not disclose that the intersection of the inner surface of the outer wall 4 and the major surface 12 of the first mold defines the perimeter of the major surface of the first mold as recited in applicant's claim 4.

Claim 6 recites, among other things, that the outer wall is securely attached to the second mold and surrounds the sheet supporting surface of the

second mold. Applicant discussed above that the outer wall of Montonen does not even contact the ring mould 13 and therefore unlike claim 6 would not be attached to the second mold, e.g. the ring mold.

Claim 7 dependent on claim 1 recites, among other things, that the outer wall has one part of an aligning arrangement and the first mold and/or the second mold has another part of the aligning arrangement. The Office Action alleges that the surface angled from the vertical of the wall 4 of Montonen cooperates with the rails of the second mold of Montonen. Fig. 2 of Montonen shows the angled portion of the wall 4 of Montonen aligned with the glass sheet. There is no disclosure in Montonen that any part of the wall 4 contacts the ring mould 13 of Montonen.

Claims 14 and 42 are dependent on claim 1. Applicant did not find the basis for the rejection of claims 14 and 42 under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C 103(a) as obvious over Montonen. In the event Applicant missed the basis for the rejection of claims 14 and/or 42, claims 14 and 42 are dependent on claim 1, and the argument put forth to patentably distinguish claim 1 over the art is applicable, among others, to patentably distinguish claims 14 and 42 over similar art.

Claim 41 recites a sheet bending apparatus having, among other things:

- a first shaping mold having a major surface and a shaping member having a press face and a perimeter;

- at least one passageway extending through the shaping member, the at least one passageway having one end terminating at the major surface of the first shaping mold adjacent to and outside the perimeter of the shaping member;

- an outline shaping mold defined as a second shaping mold, the second mold having a pair of spaced end rails and a pair of spaced central rails, the pair of spaced end rails and the pair of spaced central rails defining a boundary around an open area and portions of the end rails and the central rails providing a sheet supporting surface;

an outer wall securely attached to the second mold, inner surface of the outer wall surrounding and spaced from the sheet supporting surface of the second mold, and

an elevator arrangement acting on at least one of the first and second molds to move the first and second molds relative to one another between a first position, wherein the first and second molds are spaced from one another and the outer wall is spaced from the first mold , and a second position, wherein the first and second molds, and the outer wall form an enclosure wherein the first shaping mold provides one side of the enclosure, the second mold provides an opposite side of the enclosure, and the inner surface of the outer wall surrounds the first end of the at least one passageway.

Claim 41 recites, among other things, that the outer wall is securely attached to the second mold and the inner surface of the outer wall surrounds and is spaced from the sheet supporting surface of the second mold. The Office Action on page 21 alleges that the term "securely attached" is not a requirement that the outer wall mold part is integral to or that it is a feature of a single unitary body. Applicant respectfully disagrees and submits that the term "securely attached" has the dictionary meaning. More particularly, the term "attach" is defined in the *Webster's Third New International Dictionary*, copyrighted 1961 as "connect" and "make fast or join"; the term "securely" is defined as "firmly" and the term "fast" is defined as "firmly, fixedly, securely." As can now be appreciated, using the term "attached" in claim 41 could mean that the "outer wall is made fast to the second mold", or could mean that the "outer wall is joined to the second mold." The term "securely attached" positively recites that the "outer wall is made fast to the second mold." In other words the term "securely attached" does mean that it is a requirement that the outer wall mold part is integral to or that it is a feature of a single unitary body of the ring mold.

Even if the Office Action is correct in alleging that the term "securely attached" does mean a requirement that the outer wall mold part is integral to or



that it is a feature of a single unitary body of the ring mold, applicant respectfully submits that Montonen does not teach that that "the outer wall is ~~securely attached~~mounted to the second mold and the inner surface of the outer wall surrounds and is spaced from the sheet supporting surface of the second mold." Applicant respectfully submits that in the closest approach during the pressing operation, the inner surface of the wall 4 of Montonen is "mounted on" the glass and is spaced from the sheet supporting surface of the ring mold. With the inner surface of the wall 4 of Montonen contacting the glass it can not be said that the inner surface of the wall 4 is mounted to the supporting surface of the ring mold 13.

As discussed above, with the glass removed from between the moulds of Montonen, the wall 4 would not be brought into contact with the ring mould 13 because the ring mold 13 would damage the inner surface of the wall 4 which could damage the edge or surface of the glass during the pressing operations.

Based on the forgoing applicant respectfully requests withdrawal of the rejection of claims 1, 2, 4, 6, 7, 12, 14, 41 and 42 under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C 103(a) as obvious over Montonen.

Claim 3 dependent on claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Montonen as applied to claim 1 above, and further in view of Jacques U.S. Patent No. 5,437,703 (hereinafter also referred to as "Jacques"). Applicant respectfully traverses the rejection of claim 3 under 35 U.S.C. 103(a) as being unpatentable over Montonen as applied to claim 1 above, and further in view of Jacques and respectfully requests reconsideration of claim 3..

Claim 1 and Montonen were considered in the above discussion where applicant showed that Montonen did not anticipate or render obvious the subject matter of claim 1. Jacques does not cure the defects of Montonen because Jacques alone or in combination with Montonen fails to disclose the features and cooperation of the molds and the inner surface of the wall to provide the enclosure of the bending apparatus recited in claims 1 and 3. More particularly, as recited in claims 1 and 3 the sheet supporting surface of the second mold is

within the boundary of the wall. Applicant respectfully submits that the Office Action has failed to show any teachings in Montonen and Jacques of a bending iron that is within the boundary defined by the inner surface of a wall of an enclosure **and** has central rails above the end rails as recited in claim 3.

Based on the forgoing, applicant respectfully requests withdrawal of the rejection of claim 3 under 35 U.S.C. 103(a) as being unpatentable over Montonen as applied to claim 1 above, and further in view of Jacques.

Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Montonen as applied in the rejections of claim 1 above, and further in view of Skeen U.S. Patent No. 6,629,436B1 (hereinafter also referred to as "Skeen"). Applicant respectfully traverses the rejection of claims 8-11 under 35 U.S.C. 103(a) as being unpatentable over Montonen as applied in the rejections of claim 1 above, and further in view of Skeen and respectfully requests reconsideration of claims 8-11.

Claims 8-11 are dependent on claim 1. Claim 1 and Montonen were considered in the above discussion where applicant showed that Montonen does not anticipate or render obvious the subject matter of claim 1. Skeen does not cure the defects of Montonen because Skeen alone or in combination with Montonen fails to disclose the features and cooperation of the molds and the inner surface of the wall to provide the enclosure of the bending apparatus recited in claims 1 and 8-11. More particularly, as recited in claims 1 and 8-11, the sheet supporting surface of the second mold is within the boundary of the wall. Applicant respectfully submits that the Office Action has failed to show any teachings in Montonen and Skeen of a bending iron that is within the boundary defined by the inner surface of a wall of an enclosure **and** has central rails above the end rails as recited in claims 8-11.

Further regarding claims 9-11, the Office Action alleges that it would present a trivial extension over the prior art teachings to insure that the outer wall is connected to the outer surface of the rail. Applicant respectfully submits that claims 9-11 recite in one form or another that the outer wall is securely attached to the rails of the bending iron, i.e. the second mold. The term "attach" is defined

in the *Webster's Third New International Dictionary*, copyrighted 1961 as "connect" and "make fast or join"; the term "securely" is defined as "firmly" and the term "fast" is defined as "firmly, fixedly, securely." As can now be appreciated, using the term "attached" in claims 9-11 could mean that the "outer wall is made fast to the second mold", or could mean that the "outer wall is joined or connected to the rails of the second mold." The term "securely attached" positively recites that the outer wall is made fast to the rails of the second mold. As can be appreciated securely attaching the outer wall to the rails means that the outer wall moves with the second mold and the presence of the outer wall has to be considered when moving a glass sheet onto the rails of the bending iron. It may be that connecting the outer wall to the rails of the bending iron is a trivial extension of the prior art; however, securely attaching the outer wall to the rails as recited in claims 9-11 is not a trivial extension of the prior art.

Based on the forgoing, applicant respectfully requests withdrawal of the rejection of claims 8-11 under 35 U.S.C. 103(a) as being unpatentable over Montonen as applied in the rejection of claim 1 above, and further in view of Skeen.

Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Montonen in view of Posney U.S. Patent No. 5,437,703 (hereinafter also referred to as "Posney"). Applicant respectfully traverses the rejection of claims 15 and 16 under 35 U.S.C. 103(a) as being unpatentable over Montonen in view of Posney and requests reconsideration thereof.

Claims 15 and 16 are dependent on claim 1. Claim 1 and Montonen were considered in the above discussion where applicant showed that Montonen did not anticipate or render obvious the subject matter of claim 1. Posney does not cure the defects of Montonen because Posney alone or in combination with Montonen fails to disclose the features and cooperation of the molds and the inner surface of the wall to provide the enclosure of the bending apparatus recited in claims 1, 14 and 15.

Further, applicant respectfully submits that one skilled in the art would not replace the annular port 5 and/or channel 6 of Montonen with a plurality of pipes

or passageways as taught by Posney. More particularly, Montonen discloses that air is moved through the mold 2 to an interspace 3 between the surface 12 of the mould 2 and a glass sheet 1. The annular port 5 and channel 6 pulls the air from the interspace 3 so that the mould 2 carries the weight of the glass sheet 1. This is accomplished by a flow of air such that the flow has a static pressure  $P_1$ ,  $P_2$ ,  $P_3$  lower than the pressure loss  $P_1 - P_2$  (column 1, line 65 to column 2, line 12 of Montonen). As is appreciated by those skilled in the art, it is not difficult to maintain static pressure as required by Montonen when pulling air through a single annular port or channel, but it is extremely difficult to maintain static pressure as required by Montonen when pulling air through a plurality of passageways. Clearly there are only drawbacks to replacing the annular port 5 and /or channel 6 of Montonen with a plurality of passageways of Posney.

Based on the forgoing, applicant respectfully requests withdrawal of the rejection of claims 15 and 16 under 35 U.S.C. 103(a) as being unpatentable over Montonen in view of Posney.

Claims 24, 27, 29, 39 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Montonen in view of Kuster U.S. Patent No. 5,713,976 (hereinafter also referred to as "Kuster") and Petitcollin U.S. Patent No. 5,017,210 (hereinafter also referred to as "Petitcollin"). Applicant respectfully traverses the rejection of claims 24, 27, 29, 39 and 40 under 35 U.S.C. 103(a) as being unpatentable over Montonen in view of Kuster and Petitcollin, and requests reconsideration thereof.

Claims 24 and 27 are directly or indirectly dependent on claim 1. Claim 1 and Montonen were considered in the above discussion where applicant showed that Montonen did not anticipate or render obvious the subject matter of claim 1. Kuster and Petitcollin do not cure the defects of Montonen because Kuster and /or Petitcollin alone or in combination with Montonen fail to disclose the features and cooperation of the molds and the inner surface of the wall to provide the enclosure of the bending apparatus recited in claims 1, 24 and 27.

Claims 39 and 40 are dependent on claim 29. Claim 29 recites a sheet bending apparatus, which includes, among other things:

a chamber having outer walls, and an entry into an interior of the chamber;

a first shaping mold mounted in the chamber, the first shaping mold having a press face having a predetermined shape;

an outline shaping mold defined as a second shaping mold mounted in the chamber in facing relationship to the press face of the first mold, the second mold having a pair of spaced end rails and a pair of spaced central rails, wherein portions of the end rails and the central rails provide a sheet supporting surface with an open area within the boundary of the sheet supporting surface;

an elevator arrangement acting on at least one of the first and second molds to move the first and second molds relative to one another between a sheet receiving position where the first and second molds are spaced a first distance from one another, and a sheet pressing position where the first and second molds are spaced a second distance from one another, wherein the first distance is greater than the second distance;

a vacuum pump connected to the interior of the chamber to remove air from the interior of the chamber, and


a conduit having a first end connected to the open area between the shaping rails of the second mold, an opposite second end outside the chamber, and a portion of the conduit between the first and second ends of the conduit extending through one of the outer walls of the chamber to move air through the conduit to the open area of the second mold, wherein the open area is closed when the first and second molds are in the sheet pressing position and at least one sheet is between the press face of the first mold and the supporting surface of the second mold whereby removal of air from the interior of the chamber by the vacuum pump increases the air pressure in the conduit below the at least one sheet to bias the at least one sheet against the press face of the first mold.

Applicant respectfully submits that there are no teachings in Montonen, Kuster and/or Petitcollin of a sheet bending apparatus having, among other things, a conduit having a first end connected to the open area between the shaping rails of a mold positioned in a chamber and an opposite second end of the conduit outside the chamber, whereby removal of air from the interior of the chamber increases the air pressure in the conduit below a sheet supported on the shaping rails to bias the sheet against the press face of the first mold. This feature recited in claim 29 is not disclosed in Montonen, Kuster and/or Petitcollin.

Based on the forgoing, applicant respectfully requests withdrawal of the rejection of claims 24, 27, 29, 39 and 40 under 35 U.S.C. 103(a) as being unpatentable over Montonen in view of Kuster and Petitcollin. Further, based on the forgoing, applicant respectfully requests allowance of claims 1-4, 6-12, 14-16, 24, 27, 29, 39 and 40-43.

This amendment represents a sincere effort to place this application in condition for allowance. In the event issues remain, the Examiner is invited to call Mr. Andrew Siminerio at 412-434-4645 or the undersigned to discuss those issues before further action regarding the application is taken.

Respectfully submitted,  
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